

Armalok Continuously Molded Urethane Pipe Insulation

product data
Armalok is a unique new pipe insulation that conducts the high thermal efficiency of rigid urethane foam with the economy of fibrous glass—and adds these other outstanding advantages:

- Unusual dimensional stability
- Broad temperature range—minus 250 F to plus 220 F.
- Close dimensional tolerances simplify and speed installation.
- High compressive strength virtually eliminates problems with pipe hangers and other load-bearing applications when appropriate metal shields are used.

Armalok is continuously molded by a new manufacturing method which forms the urethane between inner and outer jackets. This highly sophisticated process results in an unusual combination of excellent physical properties not available in rigid insulations formed from slab-type materials.

Low Material Cost

The Armalok manufacturing process eliminates the waste associated with conventionally fabricated rigid pipe insulation materials which are cut from slabs or blocks. In addition, Armalok can be manufactured in single layer thicknesses up to 8" IPS.

Excellent Thermal Conductivity
Armalok has an excellent "k" factor of 0.15 Btu/in. sq ft (F deg.in.) at a 40 F mean temperature. This increased efficiency makes it possible to use substantially reduced thicknesses of Armalok without any loss of insulation value. This is particularly true for low-temperature applications below 50 F, where insulation efficiency is most critical.

Broad Temperature Range
From -250 F to +220 F. Due to its broad temperature range, Armalok can be used for all types of low- and medium-temperature applications from cryogenic to hot water heating systems.

Outstanding Dimensional Stability
Unlike conventionally fabricated rigid insulations, Armalok is a laminate with inner and outer facings intimately

bonded to its insulation core. The result is an outstanding increase in dimensional stability. After a 48-hour exposure at 220 F, Armalok exhibits only a 0.4% change in length. This characteristic insures that Armalok can handle low- and dual-temperature applications without rupture of its vapor barrier jacket.

Close Dimensional Tolerances
Because of the highly sophisticated process used to manufacture Armalok, it is possible to control pipe size, wall thickness, outside diameter, and length to close tolerances. This assures that Armalok can be easily and properly installed and eliminates the problems which have been associated with some fabricated rigid materials and molded fibrous glass products.

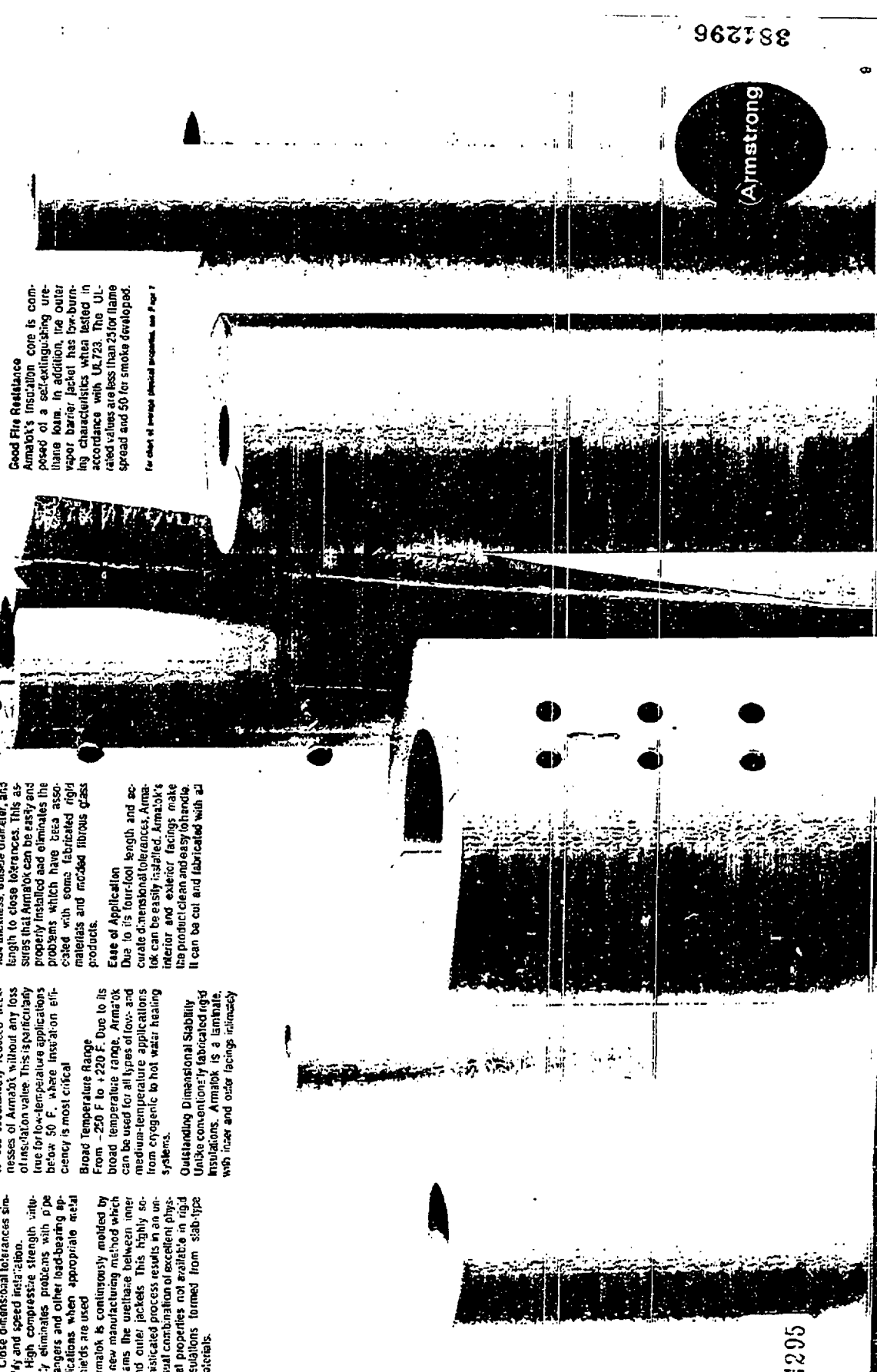
Ease of Application
Due to its four-foot length and accurate dimensional tolerances, Armalok can be easily installed. Armalok's interior and exterior facings make the product clean and easy to handle. It can be cut and fabricated with all

conventional tools, and slaps can be used to reduce application costs for all applications above 59 F.

High Compressive Strength
Pipe hangers and other load-bearing applications are no problem with Armalok when appropriate metal shields are used because of its high compressive strength of 25 psi @ 10% deflection. This feature also gives Armalok superior resistance to physical abuse during and after installation.

Good Fire Resistance
Armalok's insulation core is composed of a self-extinguishing urethane foam. In addition, the outer vapor barrier jacket has fire-retarding characteristics when tested in accordance with UL723. The UL-rated values are less than 25 for flame spread and 50 for smoke developed.

For chart of average physical properties, see Page 7



Armstrong

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Adhesives

Lagging Adhesive

A white, air-drying resin emulsion for adhering canvas, glass-fiber cloth, asbestos cloth, and other surfacing fabrics over pipe insulations, especially flange joints, tanks, and equipment. May be used as a slug for finish coats of oil or latex-base paints, and may be overcoated with Armstrong Insulcoat. Has quick initial grab and produces moisture-resistant bond with low flame-spread characteristics. Used indoors at service temperatures from -50 to +180 F.

ASTM E162 Method

Applied on Asbestos Cement Board

Flame Spread Index < 5

Optical Density of Deposited Smoke 0

Coverage, 80 to 100 sq ft per gal;

packaged in 1-gal cans and 5-gal pails. Net weight, 9.8 lb per gal.

Fire-Resistant Lagging Adhesive

Description and use are similar to Lagging Adhesive. This adhesive, additionally, passes the fire-resistance test method of MIL-A-3316A.

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Flame Spread Index < 5

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Coverage, 80 to 100 sq ft per gal;

packaged in 1-gal cans and 5-gal pails. Net weight, 10.2 lb per gal.

Duct-Bond Adhesive (clear)

A rapid-setting, rapid-strength light amber adhesive for adhering light-density glass-fiber insulation to metal ducts, wood, or concrete surfaces, for cementing laps of vapor barrier jackets and bonding joints of glass-fiber lining covers. Forms a flexible moisture-resistant bond at service temperatures from -20 to +200 F.

ASTM E162 Method

Applied on Asbestos Cement Board

Flame Spread Index 5

Optical Density of Deposited Smoke 02

Coverage, 200 to 250 sq ft per gal;

packaged in 1-gal cans, 1-gal cans and 5-gal pails. Net weight, 5.5 lb per gal.

SS Duct-Bond Adhesive (clear)

Description and use are similar to Duct-Bond Adhesive (clear). This adhesive has a nonflammable solvent and is excellent for job sites where conditions require an adhesive that eliminates the hazard and explosion during application.

operate to 160 F. Also, it may be used for bonding rubber, or plastic, excluded jacket seals to metal, plastic, or wood surfaces. Additional uses include bonding, resilient floor covering, leather, or leather-backed vinyl roll goods to wood, metal, plastic, or composition bases; thin-gauge metal-to-metal or other rigid bases; fibrous glass, cork, felt, or urethane foam insulation to metal surfaces.

ASTM E162 Method

Applied on Asbestos Cement Board

Flame Spread Index < 5

Optical Density of Deposited Smoke 0

Coverage, 200 to 250 sq ft per gal;

packaged in 1-gal cans and 5-gal pails. Net weight, 10.4 lb per gal.

Duct Insulation Adhesive

A fast-drying, rapid-strength, clear amber-colored adhesive for adhering light-density glass-fiber insulation to metal ducts, wood, or concrete surfaces, for cementing laps of vapor barrier jackets, and bonding joints of glass-fiber lining covers. It is especially suited to spray application as well as brush and roller. Forms a flexible, moisture-resistant bond at service temperatures from -20 F to +250 F.

Underwriters Laboratories, Inc., Label

Adhesive (40 U.S. 15) B-27

Adhesive Applied to Asbestos Cement Board

Flame Spread Index 0

Optical Density of Deposited Smoke 0

Coverage, 350 to 400 sq ft per gal;

packaged in 1-gal cans, 5-gal pails, and 55-gal drums. Net weight, 6.8 lb per gal.

Lap Seal Adhesive (white)

A quick-setting, high-strength white adhesive to adhere and seal lap joints of white vapor barrier jackets. Forms moisture- and vapor-resistant bond on coated surfaces operating from -20 to +200 F.

ASTM E162 Method

Applied on Asbestos Cement Board

Flame Spread Index < 5

Optical Density of Deposited Smoke 02

Coverage, 200 to 250 sq ft per gal;

packaged in 1-gal cans and 5-gal pails. Net weight, 6.5 lb per gal.

510 Adhesive

This all-purpose light-tan-colored adhesive is excellent for sealing the laps of vapor barrier jackets on pipe covering. On pipes that will operate to 220 F, 520 Adhesive is used to seal the joints of Armalex Pipe Insulation. It also may be used to apply Armalex Sheet on surfaces that will

Coatings

Armalex Finish

A vinyl-lacquer-type coating for use over Armalex Insulations. Provides a tough, high-gloss, weather-resistant film that is flexible enough to deform with Armalex without cracking. Used both outdoors and indoors without a reinforcing mesh, it possesses similar self-erecting properties as Armalex. Available in white and gray. Chemically acceptable to USDA Consumer and Marketing Service. Shipped in 1-qt and 1-gal cans and 5-gal pails. Coverage, 300 sq ft per gal, single brush coat. Net weight, 8.8 lb per gal.

Insulation Coating (fire resistant)

A cream-white air-drying adhesive coating that produces a high-strength, moisture-resistant bond as an adhesive and a tough, durable, washable surface as a finish. Used as a finish over canvas or asbestos cloth on insulations, as lagging adhesive for applying fibrous glass cloth and tape lagging, and as a size coating under Armstrong Insulcoat, oil- or latex-base paints. Conforms to MIL-A-3316B, Class 1 Adhesive (QPL-3316).

ASTM E162 Method

Applied on Asbestos Cement Board

Flame Spread Index < 5

Optical Density of Deposited Smoke 0

Used on surfaces that will operate from -20 to +180 F. Coverage, 40 to 80 sq ft per gal as a finish; 80 to 100 sq ft per gal as an adhesive. Packaged in 1-gal cans, 5-gal pails. Net weight, 10.0 lb per gal.

Insulcolor

A tough, flexible, fire-retardant, protective coating for insulated hot or cold lines, tanks and equipment, cold rooms, and air-conditioning ducts. Made in dark and light blue, dark and

Emulsions

Standard Asphalt Emulsion

A factory-mixed combination of Standard Asphalt Emulsion with special fibers and fillers. It is recommended for use where a "breathing" outdoor asphaltic finish is required. Applied either spray or trowel in two coats, each approximately 1/8" to 3/16" thick when wet. Insulastic is an excellent finishing material for high-temperature insulation exposed to the weather. Galvanized wire mesh must be applied over the insulation surface before Insulastic is applied to provide a key for the first coat.

ASTM E162 Method

Applied on Asbestos Cement Board

Flame Spread Index 5+

Optical Density of Deposited Smoke 5+

Coverage, approximately 5 sq ft per gal (two 0.085" coats); packaged in 5-gal pails and 55-gal drums. Net weight, 9.3 lb per gal.

Weatherproof Plastic

A factory-mixed, fibrous asphalt cut-back composed of special asphalt, asbestos fibers, fillers, and a petroleum solvent. It is recommended for use in conjunction with glass mesh where a weather-resistant vapor barrier is required. May not be applied directly to polystyrene foam plastic insulations.

ASTM E162 Method

Applied on Asbestos Cement Board

Flame Spread Index 60 to 55

Optical Density of Deposited Smoke 5+

Coverage, approximately 9 sq ft per gal (two 0.085" coats); packaged in 5-gal pails and 55-gal drums. Net weight, 10.0 lb per gal.

Standard Asphalt Emulsion

A clay emulsion of finely dispersed, high-grade asphalt. This is the basic ingredient of Armstrong SP Emulsion Finish (smooth finish) and Insulastic (outdoor finish). It may also be used to prepare job-mixed finishes similar to SP Emulsion. Asphalt Emulsion reinforced with embedded glass mesh and applied in a continuous, unbroken film covering the mesh is a suitable vapor barrier over cement topping of refrigerated room suspended ceilings. Coverage for this purpose is 20 sq ft per gal. Packaged in 5-gal pails and 55-gal drums. Net weight, 8.2 lb per gal.

Emulsions

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A factory-mixed combination of Standard Asphalt Emulsion with special fibers and fillers. It is recommended for use where a "breathing" outdoor asphaltic finish is required. Applied either spray or trowel in two coats, each approximately 1/8" to 3/16" thick when wet. Insulastic is an excellent finishing material for high-temperature insulation exposed to the weather. Galvanized wire mesh must be applied over the insulation surface before Insulastic is applied to provide a key for the first coat.

ASTM E162 Method

Applied on Asbestos Cement Board

Flame Spread Index < 5

Optical Density of Deposited Smoke 0

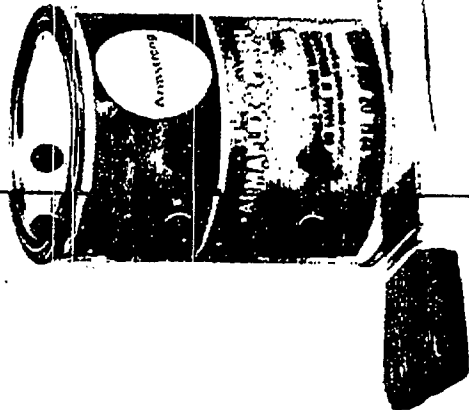
Divided with one part water to four parts Insulcolor, it is also used as a lagging adhesive and primer. Coverage, approx. 150 sq ft per gal depending on surface; packaged in 35-gal pails containing 3-gal white color tint. Packaged separately and job-mixed. Net weight, 10.3 lb per gal.

Monoplast

Monoplast is a troweled-on, hydraulic setting, two-part, job-mixed white cold storage room insulation finish. It has most of the desirable properties of Portland cement plaster, yet is light in weight and requires no metal lath or scoring. Monoplast can be used in 1/2" thickness through the entire range of refrigerated room temperatures down to 60 F below zero. A layer of glass mesh embedded in the first coat controls drying characteristics and minimizes possibility of the finish cracking when applied over polystyrene foam plastic insulation. Use in combination with a metal plate over blower units. Chemically acceptable to USDA Consumer and Marketing Service. It is shipped in complete 158-lb units consisting of 28 lb liquid and 130 lb powder. Coverage, 0.7 to 1.0 lb per sq ft according to surface covered.

SP Emulsion

Factory-mixed combination of Standard Asphalt Emulsion and asbestos fibers ready for troweling directly to insulation surface in two applications. 1/2" coats when wet. For use as interior cold room finish where a smooth surface is desired. Armstrong SP Emulsion Finish should be applied only at temperatures above 40 F. When dry, the finish can be subjected to temperatures as low as minus 25 F. A layer of glass mesh embedded in the first coat controls drying characteristics and minimizes possibility of the finish cracking when applied over



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Armalex Sheet Insulation

Thickness recommendations
Deck - Tank - Vessel - Equipment

Major Surface Temperature	Based on Design Conditions		
	Normal	Mild	Severe
50 F	1/4"	1/4"	1/4"
35 F	1/4"	1/4"	1/4"
0 F	1/4"	1/4"	1/4"

Armalex Pipe Insulation

Thickness recommendations*
(Based upon available
manufactured thicknesses)

Line Temp	Based on normal design conditions		
	Pipe Size	Based on mild design conditions	Based on severe design conditions
1/4" ID thru 3" PS	Over 10" IPS	Over 10" IPS	Over 10" IPS
3" PS	Over 10" IPS	Over 10" IPS	Over 10" IPS
50 F	1/4" Sheet	1/4" Sheet	1/4" Sheet
35 F	1/4" Sheet	1/4" Sheet	1/4" Sheet
0 F	1/4" Sheet	1/4" Sheet	1/4" Sheet

Armalex nominal standards and steeling sizes

Armalex Insulation Sizes	Copper Tubing		Actual Minimum* Wall Thickness (inches)	
	Nominal Size (in)	OD Size (in)	Nom 1/4"	Nom 1/2"
1/4" ID	1/4"	1/4"	0.30	0.39
1/2" ID	1/2"	1/2"	0.30	0.42
3/4" ID	3/4"	3/4"	0.30	0.42
1" ID	1"	1"	0.30	0.42
1 1/2" ID	1 1/2"	1 1/2"	0.30	0.42
2" ID	2"	2"	0.30	0.42
2 1/2" ID	2 1/2"	2 1/2"	0.30	0.42
3" ID	3"	3"	0.30	0.42
3 1/2" ID	3 1/2"	3 1/2"	0.30	0.42
4" ID	4"	4"	0.30	0.42
5" ID	5"	5"	0.30	0.42

Rigid Armalex table of pipe supports

Rigid Armalex Sizes	Copper Tubing		Nominal Ins. Pipe Size (in)	Recommended Support Length Inches (min)*	Recommended Pipe Hanger Spacing Feet (max)*
	Nominal Size (in)	OD Size (in)			
1/4" ID	1/4"	1/4"	3	4	7
1/2" ID	1/2"	1/2"	4	4	7
3/4" ID	3/4"	3/4"	4	4	7
1" ID	1"	1"	4	4	7
1 1/2" ID	1 1/2"	1 1/2"	6	6	8
2" ID	2"	2"	8	8	9
2 1/2" ID	2 1/2"	2 1/2"	8	8	9
3" ID	3"	3"	10	10	10
3 1/2" ID	3 1/2"	3 1/2"	12	12	12
4" ID	4"	4"	14	14	14
5" ID	5"	5"	16	16	16

Armalex Sheet Insulation is not to be used in the specified temperature range with present conditions on commercial vessels for Non-mild, Mild and Severe design conditions as detailed below

Based on severe design conditions		
Line Temp	1/4" ID thru 10" IPS	Over 10" IPS
50 F	1/4" Sheet	1/4" Sheet
35 F	1/4" Sheet	1/4" Sheet
0 F	1/4" Sheet	1/4" Sheet

Steeling Sizes			
Nom 1/4"	Nom 1/2"	Nom 3/4"	Nom 1"
1/4" ID	1/4" ID	1/4" ID	1/4" ID
1/2" ID	1/2" ID	1/2" ID	1/2" ID
3/4" ID	3/4" ID	3/4" ID	3/4" ID
1" ID	1" ID	1" ID	1" ID
1 1/2" ID	1 1/2" ID	1 1/2" ID	1 1/2" ID
2" ID	2" ID	2" ID	2" ID
2 1/2" ID	2 1/2" ID	2 1/2" ID	2 1/2" ID
3" ID	3" ID	3" ID	3" ID
3 1/2" ID	3 1/2" ID	3 1/2" ID	3 1/2" ID
4" ID	4" ID	4" ID	4" ID
5" ID	5" ID	5" ID	5" ID

*When not in direct contact with and from pipe ends, support length and pipe hanger spacing are based upon non pipe.
28ga (11" IPS and larger) the same length as the Rigid Armalex are to be used at all pipe hanger locations

*Armalex in the thickness noted and within the specified temperature range will prevent condensation on inside piping under design conditions defined below.
Armalex maximum service temperature is 50 F and 35 F and 0 F. Armalex maximum service temperature is 50 F and 35 F and 0 F. Armalex maximum service temperature is 50 F and 35 F and 0 F.

*Wall thickness tolerances -0.015" except Nom 1/4" thickness 1/32" (0.03125") -0.015".
*Available Nom 1/4" or Non 1/4" thickness only.
*Based on average wall thickness designed for factoring tolerances not applicable to Rigid Armalex.
*If Coast Armstrong cannot office for site availability of AC/Amalex.



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